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The regulator-regulatee interaction: insights taken from a high risk business firm

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The viewpoint taken in this paper is to give a description of the interaction between regulators and regulated organisations, built on an empirical case-study in the French chemical industry. The paper stems from a collective interdisciplinary research study on risk management in high-hazard facilities. Therefore, it gathers the observations and reflections of a sociologist (Michèle Dupré), a risk engineer trained in the social sciences (Jean-Christophe Lecoze), and a trainee political scientist (Julien Etienne) who all spent some time studying the same case.

In a first part, we will introduce the French regulation of industrial high risks and uncover its most salient risk tolerant characteristics. In the French case, risk tolerance yields substantial place for exchange in the regulatory interaction, that in due turn may yield cooperation and trust between regulator and regulatee. That, we may illustrate with our case study in the second part of the paper. At several moments in the interaction between the company and the regulating agency over the ten to fifteen years, there have been examples of flexibility and dialogue, in spite of or thanks to a quite strong imbalance between the two. In the third part of the paper, we question the interest of such a flexibility (and of risk tolerance in general) from a reliability standpoint. For that matter, the organisational modes of each party are studied in isolation and in interaction. The question we intend to answer is: does practice in that case suggest that the interaction “works”, namely that it yields benefits in terms of risk prevention?

We will then conclude by raising questions about the capacity of the regulator to enhance risk prevention.

I. The French regulatory regime

The French regulation of industrial high hazards consists mainly in what has been called a “safety case approach” (Hale et al. 2002). The general idea of the safety case is that the prevention of risks is under the responsibility of the owner, who is authorised to go on with his productive practices given that he *demonstrates* to the public authorities (the Inspectorate) that he has identified the main hazards, assessed the magnitude of the outcomes, and taken appropriate steps in order to prevent the hazards from materializing or to mitigate their consequences. Practically, this is achieved with the help of a system of permits and a program of scheduled and spontaneous inspections. Although the implementation of the Seveso II directive (in France, in 2000) has helped to spread further the principles of safety cases in the French regulation of highly hazardous facilities, those were well defined earlier in a law from 19/07/1976. As the safety case approach often implies, the French legislation of high hazards is actually little prescriptive: it does not specify in detail which techniques should be adopted in order to assess or prevent the risks from yielding catastrophe, and generally (and increasingly) demands the satisfaction of goals rather than means. It is therefore not infrequent, especially in bigger groups, that the firm’s own prescriptions to tackle risks go beyond public ones.

In other words, it has been well understood that there were several ways to do things right, and that the public authorities would not force firms to pick up one. Of course, this is not an absolute principle, and several other aspects may be called prescriptive. For example, there are times when inspectors actually give firms no choice but to adopt a specific tool, a tendency that has been often observed in small and middle-sized companies where regulators have often gone beyond external control and towards a bigger advisory role. There are also certain specific pieces of legislation (mostly dealing with dangerous substances) which are clearly prescriptive. Besides, the IPPC directive has generalized the idea of “best available technologies” (BAT), which should theoretically rule the prescriptions that the Inspectorate may impose upon regulatees. A recent reform has also favoured a particular method for risk assessment rather than any other, hence inducing companies to adopt it, or rather to go into lengthy and costly justification and explanation of their own method.

Yet, explicit instructions of tolerance have been given to the Inspectorate's agents, mainly consisting in the preservation of firms' economic sustainability. That is not a definitive twist in the French regime, and the issue of safety/economy trade-offs has been handled in different ways over the years: sometimes regulatory texts emphasized the dual role of the Inspectorate as both a controller and a supporter of the industry; at other times, they strived to uncouple control and advice, risk management and economic support. Although there has been a relative regulatory instability on that aspect over the years, one may rather observe stability on the side of the personnel in charge of implementation. In fact, the professionalization of the Inspectorate's agents (engineers for the bigger part) and their institutional situation in the French administration (they are employed by the Ministry of Industry within the bigger Finance Ministry but are permanently "borrowed" by the Ministry of Environment) drives them towards an "integrated" view of companies, one that balances environmental and economic imperatives. One may thus observe that the "integrated" philosophy of the Inspectorate as an administration "at the service of a clean and well-performing industry" has been explicitly abandoned by the Ministry, but endures in the discourse of the union representing about 80% of the Inspectorate's agents (the "SNIIM"). This practically reinforces the risk-tolerant character of the French regulation and counteracts the prescriptive dimension brought about by these other inputs.

Risk-tolerance decisively shapes the regulator-regulatee relationship: inasmuch as companies do not stand in an adversarial attitude towards the Inspectorate, the wide discretion left to the Inspectorate's agent provides space for building a cooperative relationship between the two parties (Ayres and Braithwaite 1991). That is, there is a range for a negotiation, one that may bear on various aspects, including the schedule for implementing compulsory modifications of an installation for the sake of accident prevention. Practically, dialogue and a sufficient sharing of information could allow the interaction to continuously unfold in an informal, sanction-less way: there, persuasion comes up as a central regulatory strategy (on both sides), while deterrence comes second. Cooperative behaviour is often met with tolerance: unlike the EPA in the United States (Eisner 2004), the Inspectorate does not sanction self-reported violations. And when violations are discovered by the Inspectorate, the procedure of administrative sanctioning requires a warning to be issued firstly, and a sanction applied only after the violator has been given time to adjust to regulatory prescriptions. The statistics of the Inspectorate's activities amply demonstrate that risk-tolerance does not necessarily mean permissiveness, for the regulator-regulatee interaction may well be conflictuous and yield the use by the Inspectorate of several warnings, administrative penalties, or lead to bigger

criminal sanctions. Hence, the French regime is in practice far from “regulatory unreasonableness” (Bardach and Kagan 1982).

That being said, let us now turn to our case study, and how it developed several characteristics which, in our view, reveal traits of risk tolerance on the regulator’s side, and an overall atmosphere of trust and cooperation between regulator and regulatee.

II. Risk tolerance in interaction and trust

After a presentation of the firm and the local branch of the Inspectorate (A), we provide evidence of risk tolerance and cooperation in the relation between that firm and the local branch of the Inspectorate in charge of high risk policy implementation (B).

A. The parties

The plant described here is an entity of a chemical company located in the USA and owner of 100 subsidiaries all over the world. The company is organised under a matrix principle. It means that certain activities are centralised either in the headquarters or in plants having specific resources to deal with specific questions. It is in particular the case of the French plant : two departments have worked either at a global corporate level, namely the safety department, or at a European level, namely the R&D department. Due to different restructurings of the production lines in the world, the plant has gained a leading role in its production segment, but a marginal position when we consider the global production set of the whole company. It has around 350 employees.

In accordance with the literature, the plant can be described as a High Reliability Organisation (Roberts, 1990): it has a very safe production history with no accident registered in the last 22 years, the safety perception of the employees is reinforced by different tools and systems, and as we will see, it has very good relations with the regulator because it fits with the objectives given by public regulation to the industry.

The company interacts on a regular basis with one to two agents from the local branch of the Inspectorate, which is an organisation that has lived through various evolutions in terms of size and missions over the last 10 years. It has been lately merged with another administrative agency in charge of natural risks and nature protection plans, and it customarily has been in charge of both risk regulation (chronic and accidental risk), industrial development (namely support to industrial innovation and research) and until recently technical controls of transport vehicles. At the time of the inquiry, it had about 150 employees, with about a third in charge of industrial environment matters. Although about 10'000 premises were eligible to environmental regulation in the area, the Inspectorate focused its attention on about a tenth of them, which due to higher risks were required to obtain permits and were more regularly and stringently controlled.

B. The climate of the interaction

The regulator-regulatee relation has been presented by both parties as a fruitful interaction, one in which it has been easy to reach each other and to exchange, where goodwill and transparency have ruled for quite some time, and where parties respect each other. In other words, a relation of trust. Let us explore it further.

Although the premises have belonged to an American company for about two decades, the Inspectorate has kept the memory of its previous owner, and the way it handled safety issues. From that time on, the public regulator had faced an open interlocutor, namely the previous director and the managers in charge of environmental matters. Several efforts were initiated at that time, some of them triggered by a major accident which took place in these years, and the subsequent modifications to the premises which the Inspectorate overlooked. Despite the change of owner, it appears that the “good traditions” were kept (possibly passed on with the managers that remained), but also that they echoed with the strong commitment of the new owner towards safety. The latter has, in fact, an enduring excellence in safety and in-house expertise on this matter. As a consequence, some agents of the Inspectorate have expressed satisfaction at the company providing them studies rather than mere administrative paperwork. That is, in contrast with some other high risk facilities, the company did not try to perform merely “ritualistic compliance”, namely apparent fit between its safety documentation and the broad requirements of the legislation. This has not always implied that the Inspectorate’s agent in charge went into reading these studies in detail and discussed their

content. In fact, there have been times over the 20 years or so of interaction between the new direction and the Inspectorate when the treatment of hazard studies by the regulator consisted more in summarizing (and therefore, approving) rather than assessing critically their content. There, the autonomy of the Inspectorate's agents and the fact that the person in charge changed several times have allowed for some variation in the way regulatory control over safety matters has been implemented. That, however, apparently never jeopardized a by and large non-conflictuous relationship. Hard data and ample demonstration of expertise has generally allowed the company to reach agreement with the regulator, for instance when it has come to re-evaluate some regulatory prescriptions (notably quantity thresholds on release of pollutants) that it was subject to. When it comes to high risk, a salient characteristic of the company's practices is the quality of its own regulation. In fact, since standards are by and large defined on corporate level, these have been either elaborated by internal safety experts or they are those of the country where the company originated, namely the USA. And since the latter's regulation has been more demanding and detailed than the French regulation on these matters, it appears that the company has been always one step ahead of the requirements demanded in France. In general, the company has proven proactive on other matters too, such as safety management systems (it was one of the first in the area to become certified ISO 14001), before the implementation of the Seveso II directive in France introduced it as a regulatory obligation. It has also been ahead in the communication of safety issues to its environment and has taken the lead on several safety issues (such as transportation of hazardous substances) in the area.

Quite logically, the proactive attitude of the company has been praised by the regulator, and it leads the company's director and the head of the safety department to conclude that, so far the public high risk regulation has not had any impact on the company. That evaluation takes into account the changes in regulation which targeted the very relationship between regulator and regulatee. While dialogue has been well established for a long time between both parties, the Inspectorate's hierarchy at the Ministry targeted in the late 1990s and early 2000s the proximity between them, which it saw unfavourably. While the instructions to Inspectorate personnel at the time emphasized the biases induced by a position of advisor to private companies while their primary mission was control, the company's head of the safety department recalls receiving at that time information that, from then on, inspectors were not to give them advice any more. This, however, "did not change anything", and dialogue has remained the principal mode of interaction.

The cooperative relationship between these regulator and regulatee shows an outstanding record. In pair with no accidents over the past 22 years, the company did not receive from the regulator any warning in more than ten years, namely the weakest formal step the Inspectorate may take in enforcement. This is not to say, though, that the company has always been perfectly in compliance with all regulations. For instance, it happened that it decided and implemented substantial modifications of the premises without asking the Inspectorate an authorisation to do so, while legislation required it. Also, it implemented measures to improve safety but did not wait for the Inspectorate to approve them. In both cases, this was not a problem *as long as the regulatee kept the regulator informed*. In other words, self-reported violation has not been met with sanction. The only consequences of these uncoordinated actions (namely, the fact that risk-management at the company does not follow the rhythm of regulatory practice) have been delays in regulatory procedures, and also costs when the company had to remake expert studies that no longer corresponded to the actual installations. In no way, however, did that ever impede production activities.

As far as sanctions are concerned, there is an obvious adversarial tone in warnings that could undermine trust in the relationship. Hence the reluctance from the regulator to risk cooperation by sanctioning violations more formally. Also, a recent reform gave the possibility to union members to directly interact with the Inspectorate's agents on high risk matters, and did also reinforce the capacity for the Inspectorate to get directly in touch with operators and workers' representatives (instead of interacting only with their usual correspondent inside the company, namely the head of the safety department). However, the Inspectorate has ignored this possibility, and on the company's side workers' representatives consider it as a last resort in case the company's situation would come to a limit. It appears rather clearly that the continuation of cooperation between the Inspectorate and the company's officer in charge, as well as keeping a good atmosphere inside the company have been at stake here.

All in all, it appears from that overview that trust has been maintained over the years thanks to a number of factors. The fact that the firm has worked without failure during a long time is part of this no-tension based relation between the firm and the Inspectorate. The former has been able to prove regularly that it complied with the high safety demands of the regulator, and in fact went beyond them. It has also taken seriously the standpoint of the Inspectorate and the safety case regulation, which is to take up an expertise-based approach to risk management and require one party (the company) to demonstrate the other (the Inspectorate)

that it has taken charge of risk prevention. Also, the public communication engineered by the firm in order to reinforce its image of a reliable firm has contributed to maintaining trust in the interaction between regulator and regulatee. It also appears that both actors have strived not to take any steps which could be perceived by the other as evidence of uncooperative behaviour.

When considering the regulator-regulatee relationships, numerous scholars agree on the advantages of tolerance, trust and cooperation. For instance, regulatory cooperation between regulator and regulatee has been theorized as likely to increase regulatory compliance and the efficiency of policy (Ayres and Braithwaite 1991). HRO theorists also considered that the demand for trustworthiness which the public usually tends to address high risk organisations constitutes for them an incentive towards increased mindfulness of safety matters (La Porte 1996). By building trust, high risk organisations also tend to “avoid the high *transaction costs of suspicion*” (ibid. p. 68) and therefore to gain in efficiency (also Rochlin 2001, p. 48). Ayres and Braithwaite (1991), however, warned against the risks of “regulatory capture”, namely of a permissive administration, which might stem from excessive proximity between regulator and regulatee. The data we dispose of does not allow us to conclude that trust could have yielded in any way such pitfalls in the case we studied. And the good record of the company suggests that cooperation has not been an hindrance to efficient risk management either. According to the theory and to these data, it seems, therefore, that the interaction works. However, if one starts looking at the regulator and the regulatee as what they are, namely complex organisations, one might get a different picture of their interaction. In the following we propose to focus on the advantages and drawbacks that may be generated by the confrontation between two different organisational modes, that of the firm we studied and of the Inspectorate it has been interacting with. With this in sight, one might wonder whether the interaction is truly “working in practice” (La Porte and Consolini 1991)?

III. Is the interaction regulator/regulatee working in practice?

Let us first start with some trivial remarks borrowed from La Porte and Consolini. They remind us that no administrative bureaucracy is error-free, and they add that “administrative

folklore teaches us that error-making is the normal bureaucratic condition.” (1991). They go further and question how people, convinced that no organisation can really operate error-free, expect a so high reliability from firms working with hazardous materials. They call this apparent paradox the “theoretical challenges” of HRO : “such insistence on failure-free performance, is from a theoretical view, quite extraordinary” (ibid). And they sustain the idea that it could be good to study how good an organisation is in practice because “little is known systematically about the social or management aspects of such activities or the consequences for the operating organisations of attempting to attain nearly failure-free performance.” (ibid) If we were to take this sort of interrogation in our case, we might then wonder whether the apparent failure-free and transparent record of “enforced self-regulation” we observed means that all is really well, or rather whether multiple factors or strategies are operating to hide the “dark side” of risk management from the regulator-regulatee interaction?

How does the firm operate to appear failure-free? On the regulator’s side, why are the relations not more tense considering the expectations addressed to high risk activities? We will then need two moments to explain the interaction in practice. Firstly we will describe the two organisations at work (A) : on one side, the firm (A.1), on the other side, the Inspectorate (A.2) and show how the organisational modes of the two parties have an impact on the interaction (A.3). Secondly we reflect on an incident that recently took place in the premises in order to further demonstrate how difficult it is in practice to sustain the high reliability of the firm and to maintain strong ties with the regulatee at the same time (B).

A) Two organisational modes interacting

- A.1) Safety and risk prevention in a French HRO or multiple internal and external interactions

In this firm we can find different features which have been extensively described in the literature about the HROs. We will then not go into details about the different concepts guiding most of the analysis. We just would like to underline different properties which will help to emphasize our point of view.

Part of an efficient chemical group, itself leader on its market, the firm has “abundant resources allowing [it]to invest heavily in reliability-enhancing activities.” (La Porte and Consolini, 1991). It knows exactly that it has to work safely if it wants to maintain the activities within their social and economic environment, which has been so far favourable to

the firm's performance. For that purpose, they have developed in the firm a department in charge of safety, occupational health and environment protection which can be supported at a global level by peers having a high experience in safety questions: "We have specialists at world level who sometimes originated the standard used in the whole sector, they have a huge experience, they know their business very well, they regularly cross swords with other international experts all over the world. They make their experience felt." (French OEHS-Department leader, interviewed during the case study).

The operators are trained to know very well the numerous operating procedures developed¹. Different training or (internal or external) auditing systems have been elaborated to maintain the situational awareness warranting the "collective mindfulness" described as a precondition of an efficient safety culture. It is without a doubt a "networked system" (La Porte, 1996, p. 66), relying on "tight (coupled) horizontal coordination between different technical units in order to produce the desired benefits and services." (La Porte and Consolini, 1991, p. 30). That is the positive side of the network. But there is another. The OEHS department chief is in the middle of external and internal relations and he has to manage the constraints coming from both sides, namely firm's actors and regulators, and that can lead to self reported violations, as already mentioned above. For example, workers had to go inside a vessel in order to control it, but at some point they suddenly refused to do it, arguing that it was too dangerous. The R&D department developed another way to inspect the vessel, and the material was replaced before the Inspectorate had given the formal authorisation to do it.

The role of the OEHS department chief is very important, and it is partly due to the great authority he gets from his double experience as a chemistry specialist and as a safety expert. But if we consider the evolution of the firm and especially the evolution of this OEHS department, another picture of a relative decline of the organisation emerges. Firstly, because of his high technical knowledge, the head of the department has been heaved up to become an international expert. Naturally, this proves how experienced he is, but as a consequence he has to leave the production site regularly to visit other companies in the group and to train them, in particular in China, which is a new market for the group. No one has been hired to replace him or to complete the working team. It is rather the opposite, since some functions were recently outsourced after a team's member retired. Secondly, the firm has transformed its internal organisation to enhance the technical exchanges between the maintenance and the building department: they have recently been merged in the same department, so that the

¹ The workers call the SOP "the Bible".

relative strength of the OEHS department has decreased automatically, even if the safety culture is always pregnant in all activities.

Another element has to be added which puts into question the capacities of the managers to have “wide open eyes” and to always look at the whole organisation and take into account all the alternative consequences of change decisions. Even if the safety level is high, the rationality of the managers is bounded by different elements, as for example the problem they have to solve. And, they have no time for reflecting on how the new decisions can impact the system as such. During the interviews with the heads of the different organisation’s departments, it was quite clear that each of them had his own indicator, elaborated in a special work culture, in order to measure how the work has been done. For example, the maintenance department has considered that its main goal was to complete work as quickly as possible. Therefore, the time necessary to handle the new materials has not been taken into account.

This absence of a wide overlook at the firm and the focus on a small number of tasks is not surprising since “bounded rationality” (March and Simon) or “disjoined incrementalism” (Etzioni) have been well theorised in the managerial literature. But different decisions show how difficult it is to make a choice between different alternatives, so that we can agree with Hopkins when he writes: “Although safety pays, organisations frequently act in ways which are quite irrational from this point of view.” (Hopkins, 1999, p. 148) Sometimes it seems to be as if the managers had “eyes wide shut”, even though safety remains an important topic in this firm.

- A.2) Organising public oversight in the Inspectorate: dealing with constraints, dependence and imbalance

On the regulator’s side, one has to deal with the fact that the French regulatory regime for high risks is a safety case approach. Such an approach has its own requirements which administrative agencies may have trouble to fulfil, and the local authority we studied is a case in point. Resource availability has been a crucial aspect, especially since assessing safety cases requires more time and personnel available on the public side than other regulatory approaches, and especially prescriptive, “one-size-fits-all” approaches. In this context, the local Inspectorate has suffered from structural shortage in personnel, especially at the end of the 1990s, as it worked with around three quarters of the total personnel it should have had if all positions budgeted had been fulfilled (this situation is in part attributable to a high rate of

turnover). Substantial additional staff was recruited in the aftermath of the AZF accident (in September 2001), so that some of the delays in regulatory procedures have been eliminated since. But the legislative changes in the meantime also meant increased work, so that practically the Inspectorate has remained under-resourced. As it was conceptualized by various authors (e.g. Vaughan 1990) the regulator-regulatee relation is one of interdependence, where the regulator is in need of information which only the regulatee may provide. In the French case, the regulator asks the regulatee to transmit a number of documents regarding safety, including hazard studies. Since this is an external regulation, the Inspectorate does not carry its own studies. It nevertheless has to assess the outcome of those that the regulatee has passed on them. This type of system has many well-known shortcomings, mainly because there is no way for the Inspectorate to overlook the elaboration of this documentation: with whom, when, according to which method, and with what data were these studies made? The Inspectorate may try to know better by asking directly the authors of these documents. But that does not necessarily work, and in such case the Inspectorate may decide to discard the application. For example, in 2001, the Inspectorate discarded a third-party expertise of the premises because it could not find out which kind of data had been entered into the analysis.

In our case, the structural dependence of the Inspectorate towards the firm has been reinforced by the issue of expertise. Facing company risk specialists, the Inspectorate has often displayed less experienced agents or/and generalists. A striking characteristic of the French Inspectorate is that, despite its members being trained engineers, these have a cherished possibility of switching positions inside the organisation. This means that agents may spend time working on environmental regulation, but they may then switch to other missions of the Inspectorate, such as public support (mostly funding) to industrial innovation or research. Besides, inside the “Environment Division” at the Inspectorate, agents may work on other aspects than technological risks, namely pollution and waste. To tackle the issue of expertise on the Inspectorate’s side, there have been efforts towards specialisation inside the Inspectorate and building in-house expertise on technological risk, especially since the AZF accident in 2001. However, the expertise of the Inspectorate seems very dependent on keeping experience, namely field-knowledge, inside the organisation. The high rate of turnover in the organisation is therefore a big problem. One of the solutions brought forth has been tutoring for newcomers, and in spite of hierarchy and position: a technician may be the tutor of a new inspector, while the latter has a better position in the organisation (this denotes a “deference to expertise” which reminds of HROs; see Hopkins 2007). In the case we studied, the presence

of an experienced inspector at the head of the technological risk group also seemed to provide for the transmission of expertise and memory of the high risk firms to the younger inspectors. Another important organisational aspect is that the work of the Inspectorate is much planned in advance, both at the national and at the local level. The Ministry has issued every year a list of priorities and objectives to reach. Besides, the Inspectorate has to carry a predefined schedule of inspections, especially in premises where there are hazardous process or products. These objectives collide with the resources available, so that there have been trade-offs in the Inspectorate's action between tasks that had all a high priority on the public agenda. Inspections in particular had to be less frequent than scheduled. Also, there is a contextual dimension in the Inspectorate's work, namely very intense efforts demanded of the agents on certain types of premises whenever a safety risk has become prominent on the local or the national agenda (for instance, in the aftermath of an accident). That too may imply many trade offs in the Inspectorate's decisions.

Finally, with the multiplication of regulations on various topics and on different aspects of risks (chronic risk, accidental risk, technical and human factors, safety management, etc.), the work of the Inspectorate has become sliced in pieces because there is no possibility to deal with all of these at once. In particular, the inspections of premises by the Inspectorate have been more and more restricted to certain issues, aspects, or areas. In other words, the Inspectorate never inspects more than a little part of the firm, and for instance, it has dealt with safety management systems bit by bit, focusing once on performance monitoring, then on training, etc. There is therefore a structural impossibility for the regulator to have a view of the whole risk regulation effort in the firm.

- A.3) Assessing the impact of two confronting organisational modes on the interaction

Slowness has been a striking weakness of the Inspectorate, one that is at the centre of the attention of the company's head of the safety department, who can compare with neighbouring (UK, Germany) or more far away (e.g. China) countries where public regulatory procedures are being processed at a far quicker pace. More precisely, the Inspectorate and the firm have been trapped in a knot of several processes which have undermined the rapidity of public procedures: since an application for a new permit was made shortly before AZF, the company's application has taken much time to be processed by the Inspectorate, while the

company's concern for self-regulation led it to modify the premises before the safety case had been approved by the regulator. As a consequence, the latter had to ask for new expert studies regarding the installations in their new configuration, so that the company had to resubmit an updated application. In the meantime, regulatory standards were substantially modified in a way that required both company and Inspectorate to adapt. As a consequence, the procedure was further delayed and it has been several years since it has begun, and yet it is still not completed.

Nevertheless, the firm has had good relations with the inspector in charge: "he's an engineer, and it is quite easy to negotiate with him" said the department leader. Technical discussions between wannabe or actual experts passes for understanding. The dialogue has but necessary limits due to the imbalance in terms of expertise: "they don't have the in-depth knowledge we can expect from a specialist, not to compare with our experts (see above)." (Head of the Safety department) That imbalance is also triggered by regulatory evolutions: ever since their introduction in the regulatory regime the Inspectorate has felt uneasy with "safety management systems" (SMS), which depart in many ways from the technical realm which the Inspectorate's agents have been trained to deal with. Unprepared to auditing techniques and non-technical matters, the Inspectorate has been used to requiring ever more formalisation of safety management rules (there again the Inspectorate cannot overlook the elaboration of the SMS, only its outcome). As a consequence, in the case studied, the demands of the regulator have necessitated only formal adaptation of the book, nothing else. On the contrary, the firm has been proactive and has got professionals trained in quality management systems, so that there too the interaction has been uneven. On this matter, it must be also emphasized that the regulatee has also benefited from extensive knowledge stemming from performance monitoring at proximate premises ran by the owner in different parts of the world. For instance, safety issues which had already come to fore in other (American) premises employing identical products were dealt with before the Inspectorate could have brought the company's attention to them.

Although the Inspectorate has organisational principles which are non-bureaucratic, and especially a general idea of collegial decision and responsibility, it appears that the shortage of personnel and the workload have for a long time guaranteed the autonomy (or should we say the solitude?) of the inspector in charge when he had to deal with the managers at the firm. Recent modifications in the procedure have made it compulsory that inspections and the

assessment of safety cases be carried out by two inspectors rather than one, and this might level up a little the position of the regulator in the interaction.

Another point highlights the form of the interaction: it has been usual for the Inspectorate to alert the firm about what it was about to control on the forthcoming inspection; even more, the national guidelines issued by the Ministry in order to organise the work of the Inspectorate in priorities have been well publicised, so that the firm has been usually informed of what the regulator would focus upon on their next interaction. As a consequence, efforts made in the firm have been naturally concentrated on the part of the premises concerned by the topic of the inspection.

But let us now analyse a specific moment in the firm's history, namely the consequences of two incidents, for they reveal another aspect of the interaction and of the impact of the organisational dimension on the interaction.

B) Incidents in practice: How can the interaction work in the case of a “near failing HRO”?

No trial-error operation is possible in such organisations. The incidents therefore resulted from an error, although not a solitary one, but a collective one of all of those who supported a flawed design of the technical architecture. We noticed two incidents over the last few years, and after two decades of good process performance. The main technical cause had to do with the agitator stopping in both cases (one time due to a power cut and the other time due to a failure of a software component) and then creating a direct path for an uncontrollable runaway reaction, leading the rupture disk to blow and then to release the content of the vessel in the catch tank. It could have been severe incidents or accidents, but the positive side of the events is that the back up design of the installations was well dimensioned for the scenario: toxic gases were contained and only a small quantity of gas treated through the scrubber was released to the atmosphere. Different barriers were conceived in the architecture design to prevent the accident. Some of them proved their efficiency, and only one, the first in the architecture, did not succeed twice for two different reasons, but with similar effects. That means that the following barriers had to succeed in order to contain the reactions.

Without going into much detail (also for matters of confidentiality), it is interesting here to notice that a scenario found its way through to create an uncontrolled runaway reaction². It is also interesting to analyse how the different actors in the firm handled the aftermath of these incidents³.

Since the incidents were contained, “they proved twice the safe design of the installations” (Dupré, Le Coze, 2006). Even if some barriers did not operate as imagined, the others had the capacity to avoid a catastrophic event. But no one in the firm did put the architecture in question. This way to overlook the problems can be interpreted as evidence of “blind spots of the organisation” which made it impossible to learn from those incidents and hence to enhance the safety level. Different explanations can be found. Let us give two examples: the investments to remove the initial cause could have been too high; or it was impossible to criticise the R&D department without weakening the confidence in the reliability of the technical installations.

We can consider it in a different way: if most of the people working in that organization, not only at production level, but also in the R&D department or the managers contributed to construct the story that “we are very safe, don’t worry, you’ve seen we didn’t fail, we will not fail”, it may mean that all of them, even confusedly, needed to construct stories about safety : “Although it is very possible to describe what operators do, safety is above all a property emerging from relations, rites and myths, also at individual or group level, but even more at the level of the entire organisation, or at least of a large part of the organisation.” (Rochlin, *ibid*, p .62)

Such constructs are not the only consequences of the incidents. Concrete steps were also taken, such as the registration of the incidents in the incident database. Because they did not trigger any concern from the nearby towns and inhabitants, they were unsurprisingly registered as technical internal incidents. This simple act had a double effect: firstly, the representatives of the workers in charge of hygiene and safety did not take them into account, and secondly the regulator was not informed because this was an internal problem to be solved only by the organisation itself.

Here we can start to be suspicious. Are we dealing with trickery? But we can also interpret this second fact as a way to keep the interaction with the regulator as peaceful as possible and to protect the organisation itself: “Operators and their hierarchy are intimately preoccupied by

² We get close here to Perrow’s (1984) normal accident idea, of unplanned and hidden interactions within the installations.

³ That is the reason why we introduce a methodological point, namely, analysing the analyses of incidents, in order to let the “dark sides of the organisation” (Vaughan 1999) appear.

the fact that, in their search for residual errors, public authorities or experts could impose modifications that would alter the trust they themselves have in their installations” (Rochlin, 2001, p. 58)

Do these incidents reveal “dark sides” of the organisation (Vaughan 1999)? or can we consider that internally the efforts made to maintain the high safety level imply a high involvement of the management which has to steadily justify its action? Consider for example the efforts made if not to increase the resources, but to insure a safe evolution of the firm: “the better an HRO is in achieving safe, productive performance, the more difficult public overseers are to convince that resources applied to reliability enhancing activities should remain stable.” (La Porte, 1996). That is working in practice. And that is also regulating in practice. The regulator has to deal with internal organisational problems but it does not have the capacity to follow the activities and to understand the dynamics at work in a HRO.

Conclusion

When speaking about “risk tolerance” in regulation, one should keep in mind that not all kinds of “risks” lead to the same range of stakes, nor that they could all be handled in similar ways. In fact, when one is dealing with major accidental risk and very hazardous process or products, responsibility and efficiency have obviously a completely different meaning than in, say, waste management, medical practice or driving. In the management of technological risks, the blind spots of regulation may prove absolutely crucial, for they might well cover the signs of an “incubating” large-scale disaster (Turner 1978). It is therefore worthwhile to ask whether the public regulator has the capacity to uncover blind spots, and whether risk tolerance is helping or not for that matter. So far, our reflections on an empirical case as presented in this paper could not lead us to a definitive conclusion on this issue. But as we tried to look at the interaction between regulator and regulatee through the lenses of their respective organisational modes and wondered whether the interaction “worked in practice”, several points have come up as worth to reflect upon and to inquire deeper about.

Since French regulation has not been too prescriptive in matters of accidental risks and has been implemented in a way that leaves much space for dialogue and cooperation, the interaction we observed has proven not conflictuous and positive according to both parties. The very good accidental and administrative record of the company as well as the absence of

evidence of permissiveness in policy implementation support the general view of both compliance and HRO theorists, according to which cooperation and trust may yield greater policy effectiveness and industrial safety. However, both intuition as well as organisational theory suggest a less ideal picture, one that a look at the organisational modes of operation in both parties helped to reveal. Our paper shows how difficult the interaction can be due to the different organisational modes which have developed along the history of each organisation. Multiple constraints in terms of time, personnel and expertise, as well as the more structural weakness of a position of external overseer have durably undermined the capacity for the Inspectorate to level up its position in a very imbalanced interaction. Since the firm has since long considered that it “can’t depend on bureaucracy” (La Porte and Consolini, 1991, p. 20) to increase its safety performance, it has been dealing with it at a quick pace that the Inspectorate could hardly follow. This might be all well but the firm itself has got its own weaknesses: the day to day operations reveal how uneasy it is to introduce organisational changes, even to increase safety which is a challenge all actors in the firm deem to be important; there is also flawed design in the safety architecture that organisational processes foreclosed it from seeing. In this context, the problem appears to be that the precautions each party has been taking not to undermine trust and cooperation in the relation has made it impossible for the Inspectorate to help the organisation deal with its blind spots. In a time when various tendencies might weaken the management of safety inside the firm, it is therefore ironic to observe that the efforts of each actor not to jeopardize its relationship with the other might undermine the very goal that this relationship is supposed to play.

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